

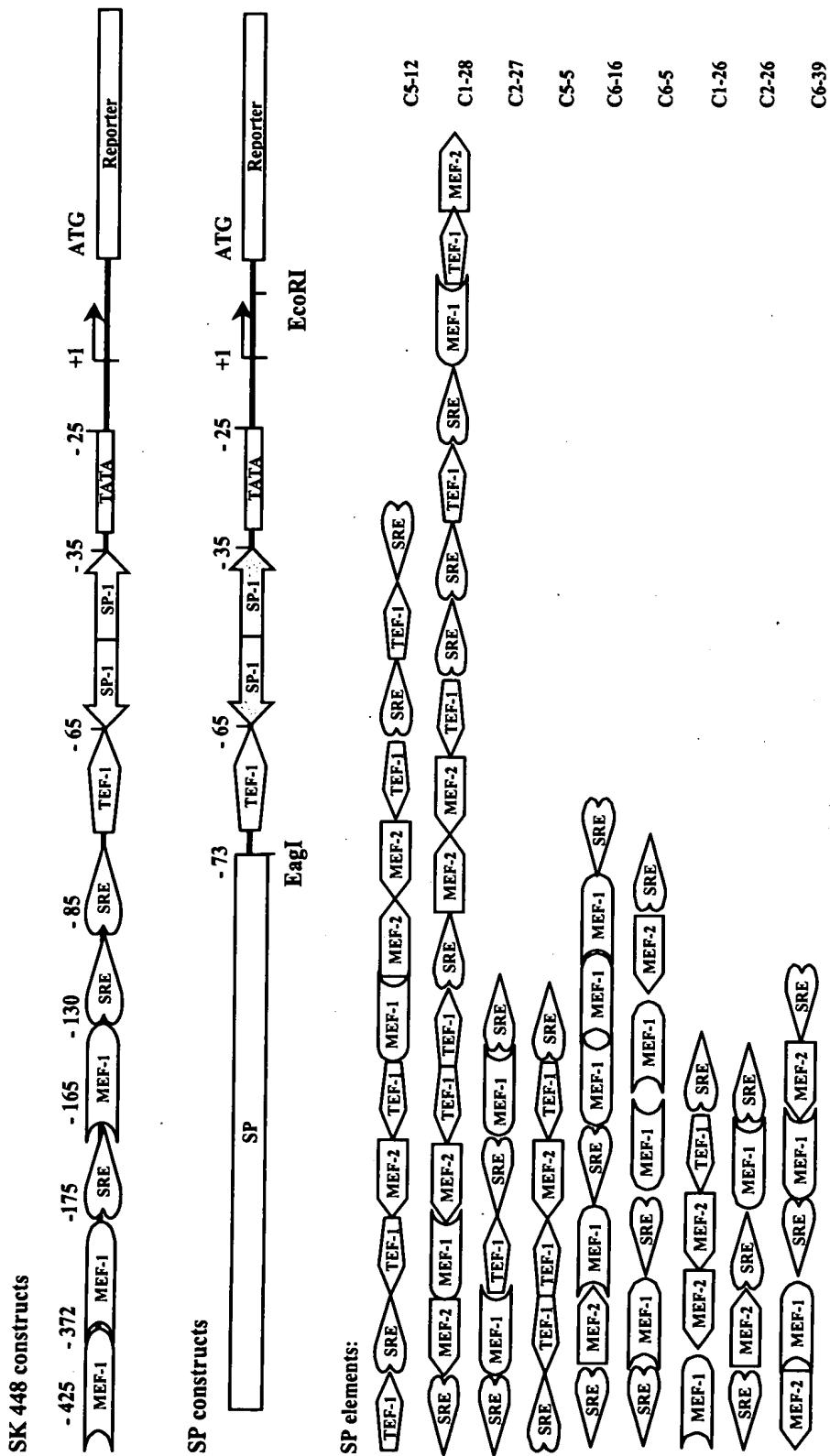
Figure 1

1/19

	Pools of regulatory elements				
Element	1	2	3	4	5
SRE	1	4	1	1	1
MEF-2	1	1	4	1	1
MEF-1	1	1	1	4	1
TER-1	1	1	1	1	4

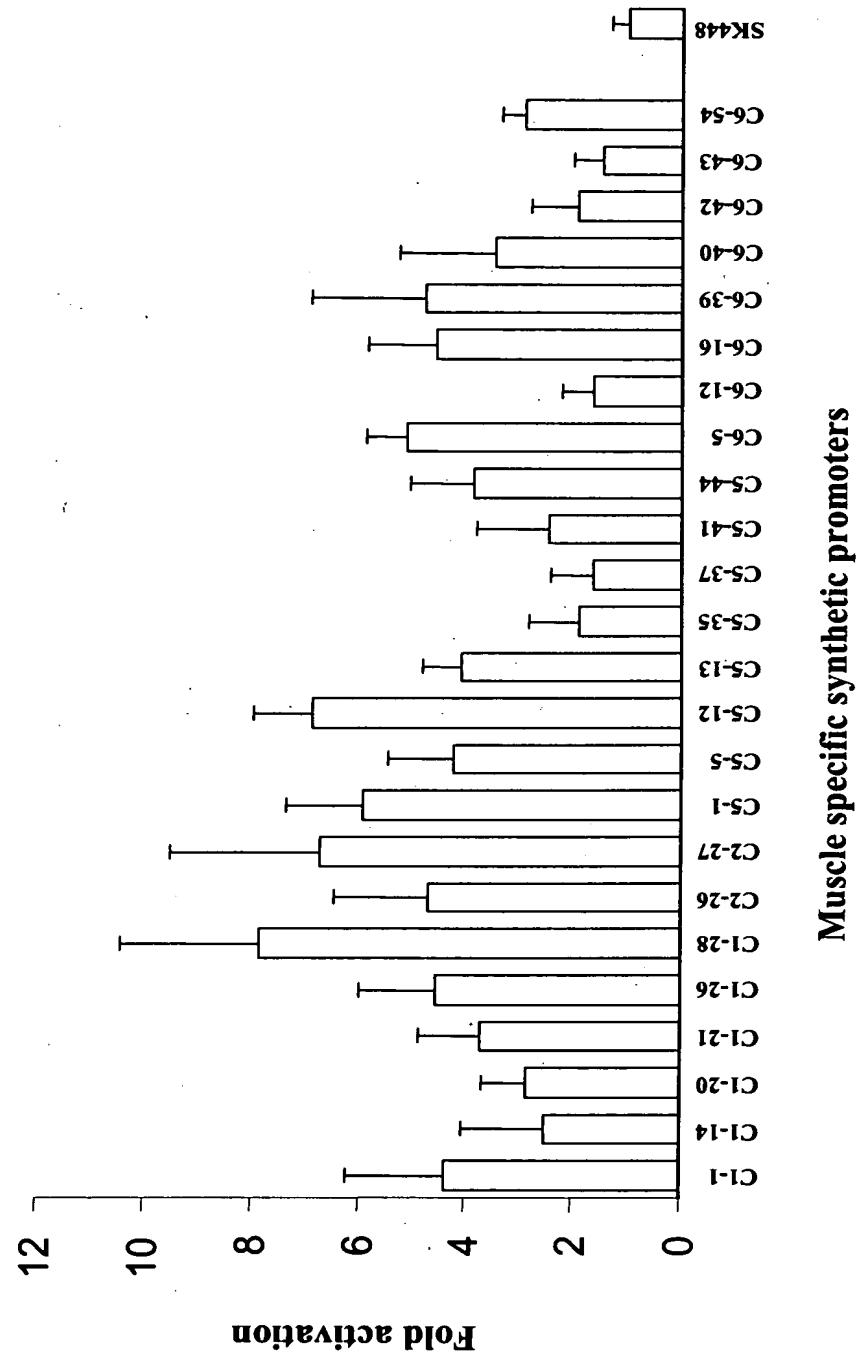
2/19

**Figure 2**



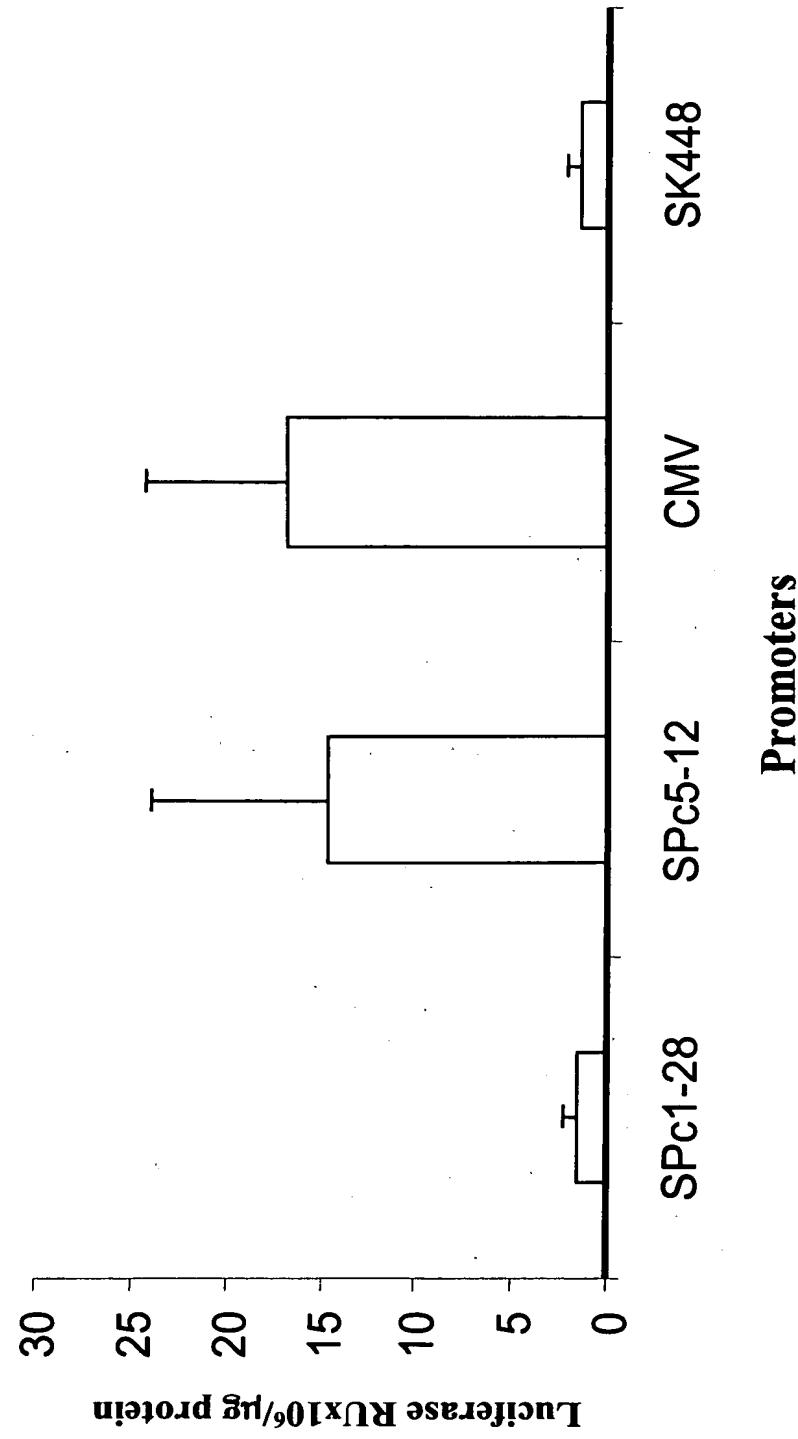
**3/19**

**Figure 3**



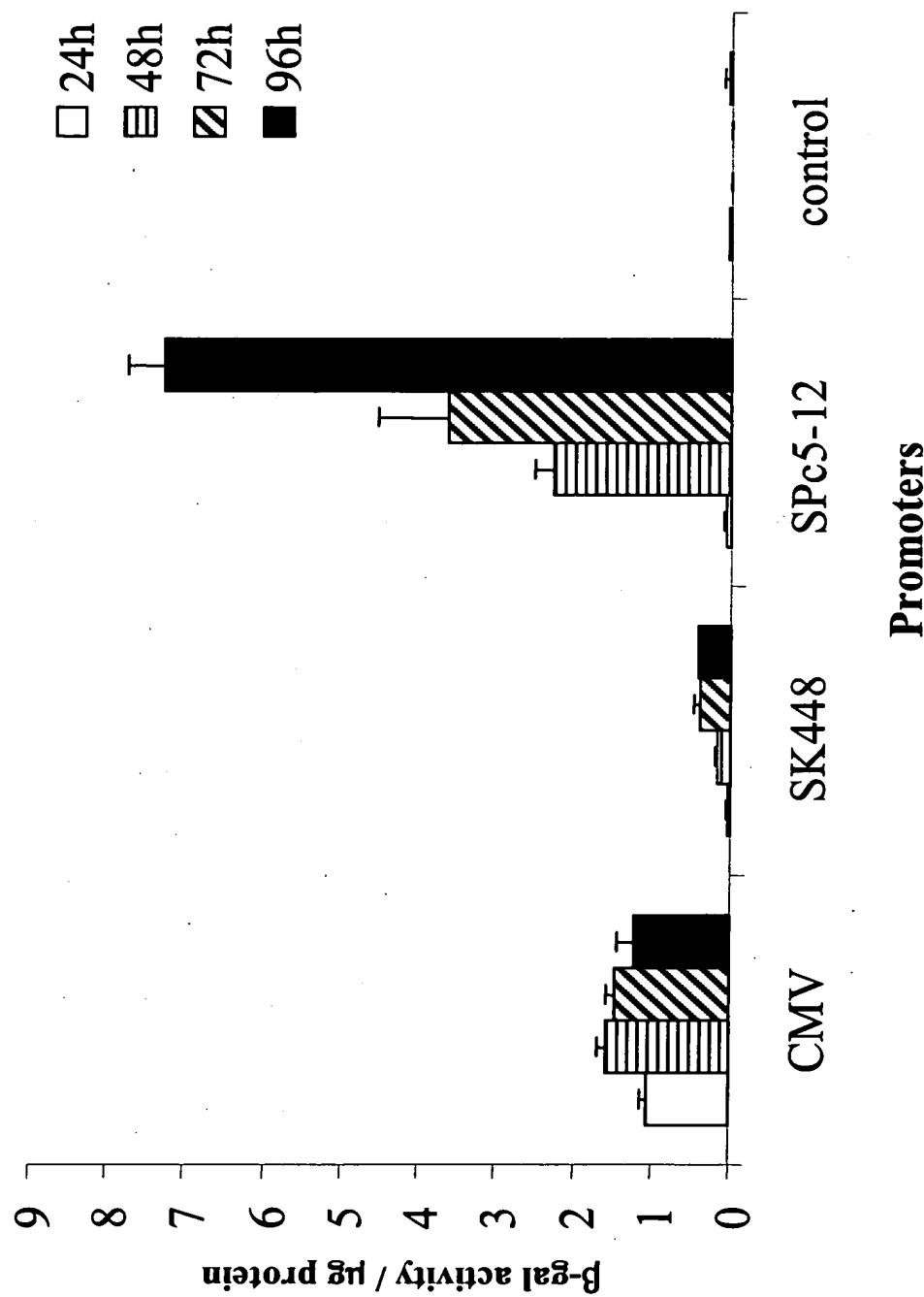
**Figure 4**

**4/19**



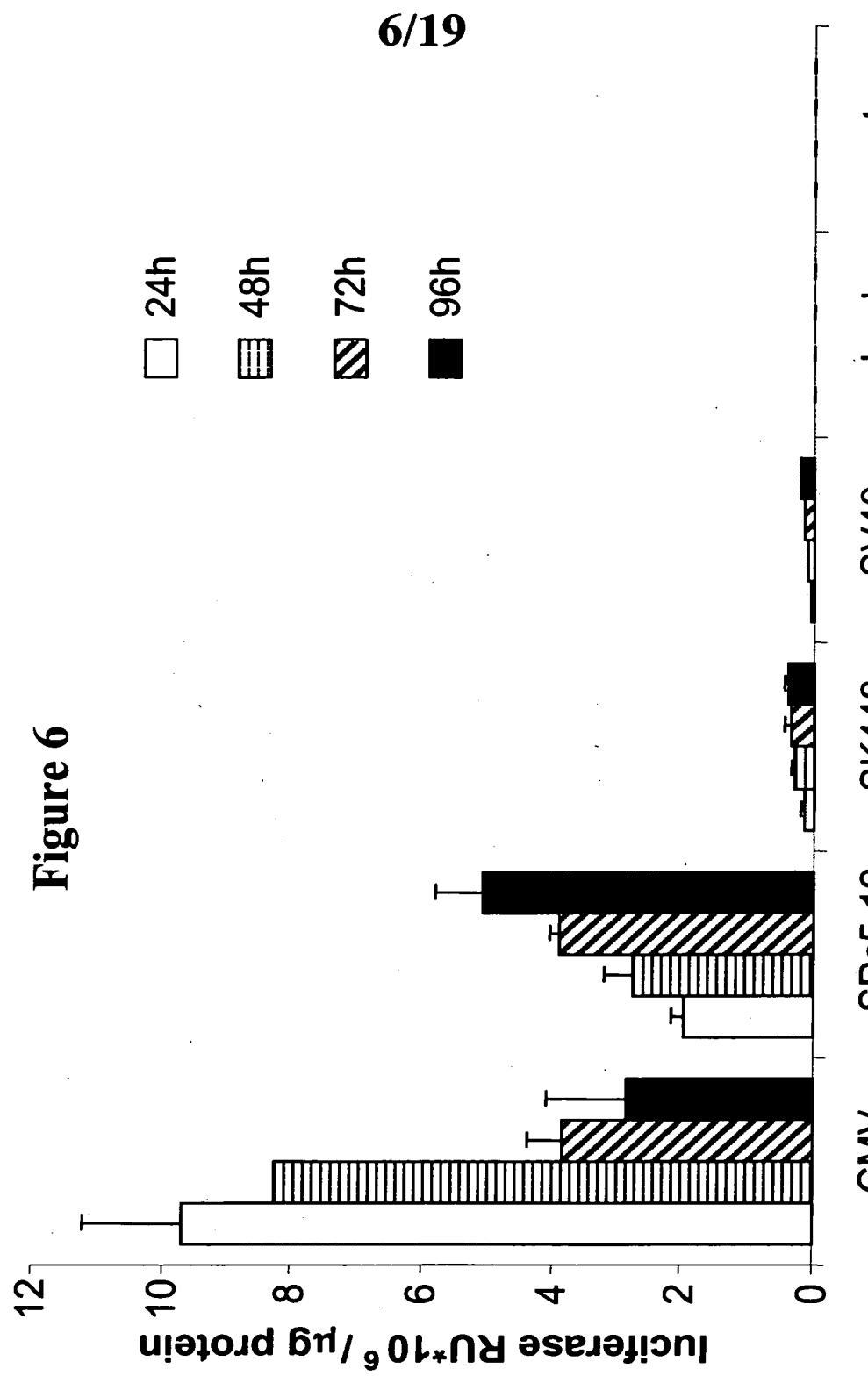
**5/19**

**Figure 5**



**promoter Figure**

CMV SP448 SK448 SV40 bgal nt



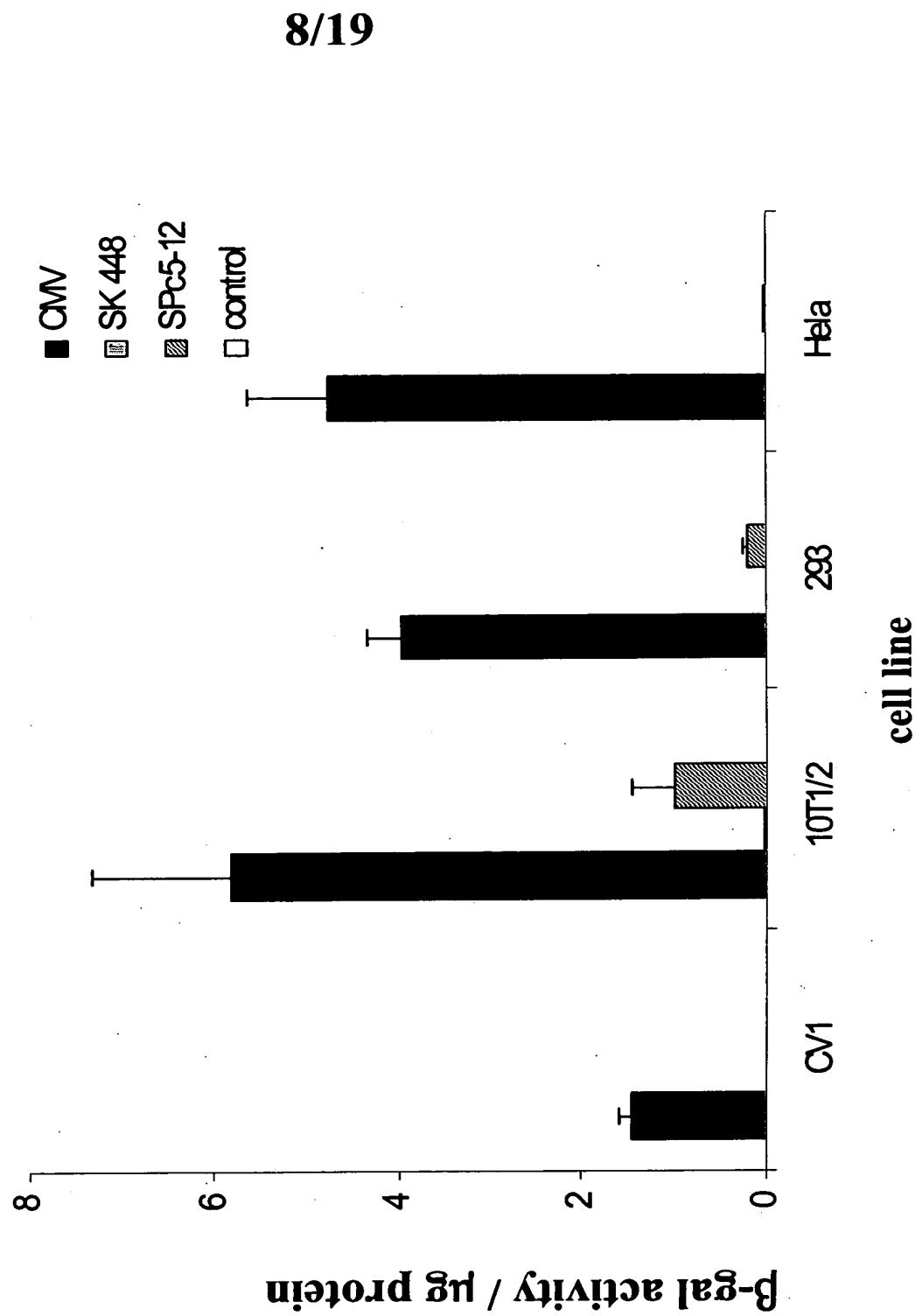
**Figure 6**

**Figure 7**

	<b>24 hours</b>	<b>48 hours</b>	<b>72 hours</b>	<b>96 hours</b>
<b>CMV</b>	9.706	8.240	3.832	2.846
<b>SPC5-12</b>	1.957	2.757	3.893	5.070
<b>SK448</b>	0.167	0.304	0.356	0.383
<b>SV40</b>	0.064	0.112	0.136	0.182
<b>bgal</b>	0.000	0.002	0.003	0.003
<b>nt</b>	0.001	0.002	0.002	0.003

**7/19**

**Figure 8**



9/19

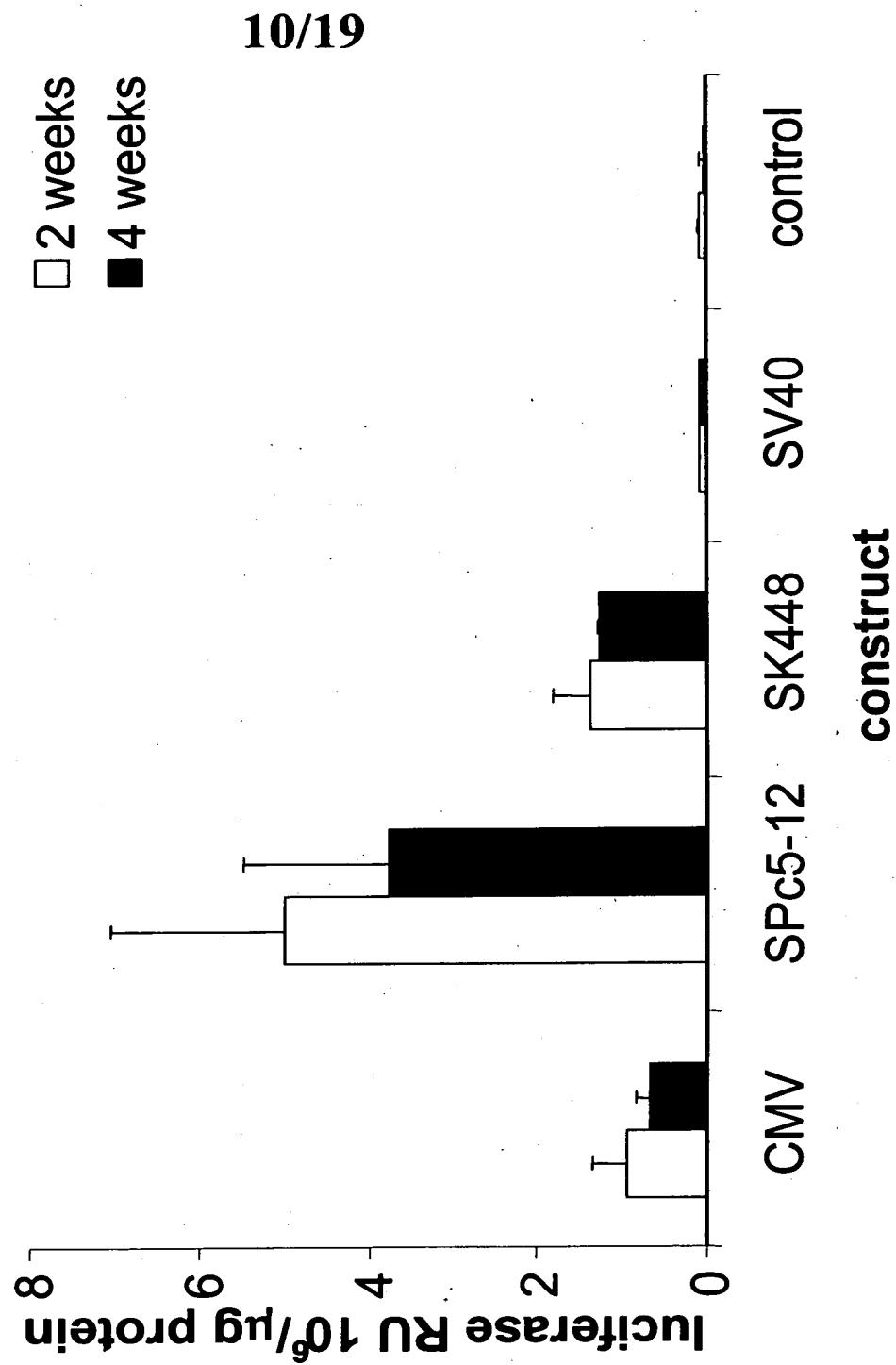
Figure 9

T B I Lg St K Lv H M Sp

$\beta$ -gal

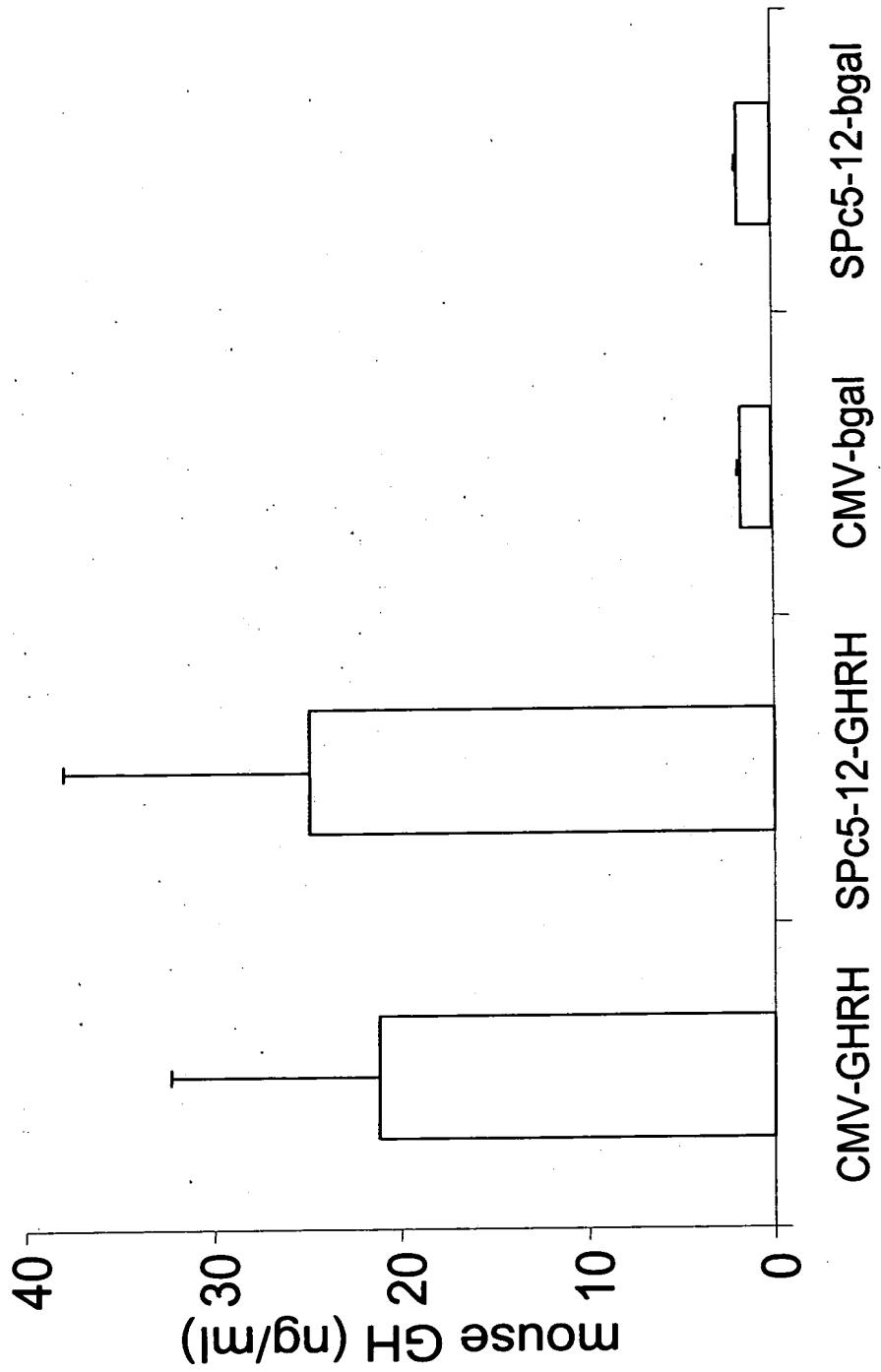
188

**Figure 10**



**11/19**

**Figure 11**



# 12/19

c1-26

<pre> cgcccgaggg cggcggggca ggcagcagggt gttggcacca ttcctcadcg ctctaaaaat           ← MEF-1           TEF-1 →           MEF-2           ↗   ← TEF-1           ← SRE           SRE → aactcccggtg aggaatggtg ccgtcgccat atttgggtgt cgacacccaa atatggcgad           ↗   ← TEF-1           ← MEF-1           SRE →           MEF-2 gggtgagggaa tggtgggcag gcagcagggtg ttggacacc caaatatggc gacggccaad           MEF-1 →           ← MEF-2           ← MEF-2           ← TEF-1 acctgctgcc tgccggagt tattttagaq gcggggagtt atttttagag cggtgaggaa           SRE → tggtgacac ccaaataatgg cgacggccgg ggccgcattc ctggggccg ggcggtgctc           300 ccgccccct cgataaaaagg ctccggggcc ggccggccgac cacgagctac ccggaggagc           360 gggaggcgcc aagctctaga           380 </pre>	60 120 180 240 300 360 380
--	--

EagI

-----

EclXI

-----

McrI

-----

XmaIII

-----

BsiEI

-----

1      GCGCCGAG GGCAGGGGG CAGGCAGCAG GTGTTGGCAC CATTCCTCAC CGCTCTAAA  
 CCCGGGCTC CGCCGCCCTC GTCCGTCAC ACAACCGTG GTAAGGAGTG GCGAGATTT

HincII

-----

HindII

-----

SalI

-----

TaqI

-----

AccI

-----

61      ATAACTCCCG TGAGGAATGG TGCCGTCGCC ATATTTGGGT GTCGACACCC AAATATGGCG  
 TATTGAGGGC ACTCCTTACC ACGGCAGCGG TATAAACCCA CAGCTGTGGG TTTATACCGC

BsmFI

-----

121     ACGGGTGAGG AATGGTGGGC AGGCAGCAGG TGTTGGACA CCCAAATATG GCGACGGCCA  
 TGGCCACTCC TTACCAACCGC TCCGTCGTC ACAACCTGT GGGTTTATAC CGCTGCCGGT  
 181     ACACCTGCTG CCTGCCGGGA GTTATTTTA GAGCAGGGAG TTATTTTAG AGCGGTGAGG  
 TGTGGACGAC GGACGGCCCT CAATAAAAAT CTCGCCCTC AATAAAAATC TCGCCACTCC

XmaIII

BmyI

-----

EclXI

EcoRII

BsiHKAI

-----

EagI

BstNI

Bsp1286I

-----

McrI

MvaI

HgiAI

-----

BsiEI

BsmI

AspHI

-----

241     AATGGTGGAC ACCAAATAT GGCAGGGCC GGGGCCGAT TCCTGGGGGC CGGGCGGTGC  
 TTACCAACCTG TGGTTTATA CCGCTGCCGG CCCGGCGTA AGGACCCCCG GCCCGCCACG

BmyI

---

BsiHKAI

NgoMI

---

Bsp1286I

Cfr10I

---

HgiAI

NaeI

**Figure 12**

# 13/19

c2-26

ggccgtcgcc atatttgggt gtcccaacac ctgcgtcctg cccgtcgcc atatttgggt 60

gtcgaggat atttttagag cgacaccca aatatggcga cggccggggc cgcattcctg 120

ggggccgggc ggtgctccc cccgcctcgtaaaaaggctc cggggccggc ggccggccac 180

gagctacccg gaggagcggg aggcgccaag ctctaga 217

BspMI

EagI

BsmFI

BbvI

1 CGGGCGTCGC CATATTTGGG TGTCCCAACA CCTGCTGCCT GCCCCGTCGC CATATTTGGG  
GCCGGCAGCG GTATAAACCC ACAGGGTTGT GGACGACGGA CGGGGCAGCG GTATAAACCC

BstNI

EcoRII

MvaI

EagI BsmI

61 TGTCGGGAGT TATTTTTAGA NCNGACACCC AAATATGGCG ACGGCCGGGG CCGCATTCCT  
ACAGCCCTCA ATAAAAATCT NGNCTGTGGG TTTATACCAC TGCCGGCCCC GGCGTAAGGA

BmyI

EcoRII Bsp1286I

NgoMI

MvaI HgiAI

Cfr10I

BstNI AspHI TaqI

NaeI

121 GGGGGCCGGG CGGTGCTCCC GCCCCGCTCG ATAAAAGGCT CCGGGGCCGG CGGGGGCCCA  
CCCCCGGGCCG GCCACGAGGG CGGGCGGAGC TATTTTCCGA GGCCCCGGCC GCCGCCGGGT

BanI

BsaHI

CfoI

HaeII

HhaI

HinP1I

KasI MaeI

NarI XbaI

BsrBI AcyI BfaI

181 CGAGCTACCC GGAGGAGCGG GAGGCGCCAA GCTCTAGA  
GCTCGATGGG CCTCCTCGCC CTCCGGGTT CGAGATCT

**Figure 13**

c2-27

← SRE                    MEF-1 →                    SRE →

ggccgtcgcc atatgggt gtccaaacac tgctgcctgc gacacccaa atatggcgac      60

gggtgaggaa tggtgccaac acctgctgcc tgccgacacc caaatatggc gacggccggg      120

gccgcattcc tggggccgg gcgggtctcc cgccgcctc gataaaaggc tccggggccg      180

gcggcggccc acgagctacc cggaggagcg ggaggcgcca agctctaga      229

<b>EagI</b> ----- 1 CGGCCGTCGC CATATTTGGG TGTCCCAACA CTGCTGCCTG CCGACACCCA AATATGGCGA GCCGGCAGCG GTATAAACCC ACAGGGTTGT GACGACGGAC GGCTGTGGGT TTATACCGT	<b>BsmFI</b> ----- 61 CGGGTGAGGA ATGGTGCCAA CACCTGCTGC CTGCCGACAC CCAAATATGG CGACGGCCGG GCCCACTCCT TACCACGGTT GTGGACGACG GACGGCTGTG GGTTTATACC GCTGCCGGCC	<b>EagI</b> ----- BmyI ----- EcoRII                    BsiHKAI                    NgoMI ----- BstNI                    Bsp1286I                    Cfr10I ----- MvaI                    HgiAI                           NaeI ----- BsmI                    AspHI                           TaqI                    BsrFI ----- 121 GGCGGCATTC CTGGGGGCCG GGCGGTGCTC CCGCCCGCCT CGATAAAAGG CTCCGGGGCC CGGGCGTAAG GACCCCCGGC CCGCCACGAG GGCGGGCGGA GCTATTTC GAGGCCCGG
---	--	--

<b>Cfr10I</b> --- HaeII ----- HhaI ----- HinP1I ----- NaeI --- NgoMI --- BsrFI --- 181 GGCGGCAGGCC CACGAGCTAC CCGGAGGAGC GGGAGGCC AAGCTCTAGA CCGCCGCCGG GTGCTCGATG GGCCTCCTCG CCCTCCGCGG TTCGAGATCT	<b>BsaHI</b> ----- CfoI --- NarI                    MaeI ----- XbaI ----- AcyI                    BfaI ----- 
--	---

Figure 14

# 15/19

c5-5

<pre> ← SRE           TEF-1 →           MEF-2 →           ← ggccgtcgcc atatgggt gtc accatt cctcac cgct ctaaaaataa ctcccgtqag </pre>	60
<pre> TEF-1   TEF-1 →           ← SRE gaatggtgca ccattcctca cccgtcgcca tattgggtg tcggagggc ggacggccgg </pre>	120
<pre> ggccgcattc ctggggccg ggcggtgctc cgcggccct cgataaaaagg ctccggggcc </pre>	180
<pre> ggcggccggcc cacgagctac ccggaggagc gggaggcgcc aagctctaga </pre>	230

**Figure 15**

<b>EagI</b> ----- 1      CGGCGGTGCG CATATTTGGG TGTCCACCAT TCCTCACCGC TCTAAAAATA ACTCCCGTGA GCCGGCAGCG GTATAAACCC ACAGGTGGTA AGGAGTGGCG AGATTTTAT TGAGGGCACT	<b>ApaLI</b> ----- SnoI ----- Alw44I -----	<b>BsmFI</b> ----- AvaI ----- EagI -----
61      GGAATGGTGC ACCATTCCCTC ACCCGTCGCC ATATTTGGGT GTCCCGAGGG CGGACGGCCG CCTTACACG TGGTAAGGAG TGGGCAGCGG TATAAACCCA CAGGGCTCCC GCCTGCCGGC	<b>BstNI</b> ----- EcoRII ----- MvaI -----	<b>Cfr10I</b> -- NgoMI -- NaeI -- BsrFI -- 
121      GGGCCGCATT CCTGGGGGCC GGGCGGTGCT CCCGCCGCC TCGATAAAAG GCTCCGGGGC CCCGGGTAA GGACCCCCGG CCCGCCACGA GGGCGGGCGG AGCTATTTTC CGAGGCCCCG	<b>BanI</b> ----- BsaHI ----- Cfr10I ----- HaeII ----- HhaI ----- HinP1I ----- NaeI ----- NgoMI ----- BsrFI ----- 	KasI ----- MaeI ----- NarI ----- XbaI ----- AcyI ----- BfaI ----- 
181      CGCGGGCGGC CCACGAGCTA CCCGGAGGAG CGGGAGGCGC CAAGCTCTAG A GCCGCCGCCG GGTGCTCGAT GGGCCTCCTC GCCCTCCGCG GTTCGAGATC T		

16/19

c5-12

ggccgtccgc ctccggcacc atcctcadga cacccaaata tggcgacggg tgaggaaatgg 60  
 ↙MEF-2 ↘MEF-1 MEF-2  
 tgaggagta ttttagagc ggtgaggaag qtqqqcaqqc aqcaqqtgtt ggctctaa 120  
 → ↙MEF-2 ↘SRE →  
 aaataactcc cggagttat ttttagagcq gaggaatggt ggacacccaa atatggcgcac 180  
 ↙SRE  
 gggtcc tac ccgtcgccat atttgggtgt cggccctcg cgccggccgc attccctgggg 240  
 gcccggccgt gctccgccc gcctcgataa aaggctccgg ggccggccgc ggcccacgag 300  
 ctacccggag gagcgggagg cgccaagctc taga 334

	EagI	Poki
1	CGGCCGTCCG CCTTCGGCAC CATCCTCACG ACACCCAAAT ATGGGCACGG GTGAGGAATG GCCGGCAGGC GGAAGCCGTG GTAGGAGTGC TGTGGGTTA TACCGCTGCC CACTCCTTAC BspMI	----- BbvI
61	GTGGGGAGTT ATTTTAGAG CGGTGAGGAA GGTGGGAGG CAGCAGGTGT TGGCGCTCTA CACCCCTCAA TAAAAATCTC GCCACTCCCT CCACCCGTCC GTCGTCCACA ACCGCGAGAT	----- SmaI
	XmaI	----- XbaI
	AvaI	----- ApaI
121	AAAATAACTC CGGGAGTTA TTTTAGAGC GGAGGAATGG TGGACACCCA AATATGGCGA TTTTATTGAG GGCCTCAAT AAAATCTCG CCTCCTTACC ACCTGTGGGT TTATACCGCT	BstNI ----- EcoRII ----- MvaI
	EagI	BsmI
181	CGGTTCTCA CCCGTCGCCA TATTTGGGTG TCCGGCCTCG GCGGGGGCGG CATTCTGGG GCCAAGGAGT GGGCAGCCGT ATAAACCCAC AGGCGGGAGC CGGCCCCCGGC GTAAGGACCC	----- BmyI
	BsiHKAI	NgoMI
	Bsp1286I	Cfr10I
	HgiAI	NaeI
	AspHI	TaqI
	BsrFI	----- BsaHI
241	GGCGGGCGG TGCTCCCGCC CGCTCGATA AAAGGCTCCG GGGCCGGCGG CGGCCAACGA CCGGCCCGCC ACGAGGGCGG CGCGAGCTAT TTTCCGAGGC CCCGGCCGCC GCGGGTGCT	MaeI ----- NarI XbaI ----- AcyI BfaI
	KasI	----- XbaI
		----- BfaI
301	GCTACCCCGA GGAGGGGAG GCGCAAGCT CTAGA CGATGGGCCT CCTCCGCCCTC CGCGGTTCGA GATCT	----- BfaI

Figure 16

17/19

c6-5

$\leftarrow$ SRE                            MEF-2 $\rightarrow$ <u>ggccgtcgcc atatttgggt gtcgcgtcta aaaataactc ccggcaggca gcagggttgt</u>	60
MEF-1 $\rightarrow$ SRE $\rightarrow$ $\leftarrow$ MEF-1 <u>gccaacacct gctgcctgcc</u> <u>gacaccaaata tggcqacgg</u> <u>ggcaggcagc aggtgttgt</u>	120
SRE $\rightarrow$ <u>acacccaaat atggcgcacgg</u> <u>ccggggccgc attcctgggg</u> <u>gccgggcgggt gctcccggcc</u>	180
<u>gcctcgataa aaggctccgg</u> <u>ggccggcggc ggcccacgag</u> <u>ctacccggag gagcgggagg</u>	240
<u>cgccaagctc taga</u>	254

Figure 17

<b>MscI</b> ----- 1      CGGGCGTCGC CATATTGGG TGTCGGCTCT AAAAATAACT CCCGGCAGGC AGCAGGTGTT GCCGGCAGCG GTATAAACCC ACAGGGAGA TTTTTATTGA GGGCGTCCG TCGTCCACAA	<b>MluNI</b>
<b>EagI</b> ----- 61     GGCACACACC TGCTGCCTGC CGACACCAAA TATGGCGACG GGGCAGGCAG CAGGTGTTGG CCGGTTGTGG ACGACGGACG GCTGTGGTTT ATACCGCTGC CCCGTCCGTC GTCCACAACC	<b>BamHI</b>
<b>MscI</b> ----- <b>MluNI</b> ----- 61     GGCACACACC TGCTGCCTGC CGACACCAAA TATGGCGACG GGGCAGGCAG CAGGTGTTGG CCGGTTGTGG ACGACGGACG GCTGTGGTTT ATACCGCTGC CCCGTCCGTC GTCCACAACC	<b>BmyI</b>
<b>BsmFI</b> <b>EagI</b> <b>BsmI</b> <b>AspHI</b> ----- 121    GACACCCAAA TATGGCGACG GCGGGGGCGG CATTCTGGG GGCGGGCGG TGCTCCCGCC CTGTGGGTTT ATACCGCTGC CGGCCCGGCC GTAAGGACCC CCGGCCGCC ACGAGGGCGG	<b>EcoRII</b> <b>BsiHKAI</b> ----- <b>BstNI</b> <b>Bsp1286I</b> ----- <b>MvaI</b> <b>HgIAI</b> ----- <b>BsmFI</b> <b>EagI</b> <b>BsmI</b> <b>AspHI</b> ----- 121    GACACCCAAA TATGGCGACG GCGGGGGCGG CATTCTGGG GGCGGGCGG TGCTCCCGCC CTGTGGGTTT ATACCGCTGC CGGCCCGGCC GTAAGGACCC CCGGCCGCC ACGAGGGCGG
<b>BanI</b> ----- <b>BsaHI</b> ----- <b>HaeII</b> ----- <b>KasI</b> ----- <b>NarI</b> ----- <b>AcyI</b> ----- <b>BanI</b> ----- <b>BsaHI</b> ----- <b>CfoI</b> ----- <b>HaeII</b> ----- <b>HhaI</b> ----- <b>HinP1I</b> ----- <b>KasI</b> <b>MaeI</b>	<b>BanI</b> ----- <b>BsaHI</b> ----- <b>HaeII</b> ----- <b>KasI</b> ----- <b>NarI</b> ----- <b>AcyI</b> ----- <b>BanI</b> ----- <b>BsaHI</b> ----- <b>CfoI</b> ----- <b>HaeII</b> ----- <b>HhaI</b> ----- <b>HinP1I</b> ----- <b>KasI</b> <b>MaeI</b>

18/19

c6-16

<pre> SRE →          ← MEF-1          ← MEF-1/ ggccgagggc ggacaccaaa tatggcgacg gggcaggcaq caggtgttgg ggcaggcagc </pre>	60
<pre> ← MEF-1   MEF-1 →          SRE →          ← MEF-1/ agggtgttggc caacacctgc tgcctgccga cacccaaata tggcgacggg qcaggcagca </pre>	120
<pre> ← MEF-1   ← MEF-2          SRE → ggtgtgggg gqgttatatt tagaqcgac acccaaataat ggcgacggcc gggccgcata </pre>	180
<pre> tcctgggggc cggggcggtgc tcccggccgc ctgcataaaa ggctccgggg ccggcgccgg cccacagact acccggagga gcgggaggcg ccaagctcta ga </pre>	240
	282

EagI

1 CGGGCGAGGG CGGACACCAA ATATGGCGAC GGGGCAGGCA GCAGGTGTTG GGGCAGGCAG  
GCCGGCTCCC GCCTGTGGTT TATACCGCTG CCCCGTCCGT CGTCCACAAC CCCGTCCGTC

MscI

MluNI

61 CAGGTGTTGG CCAACACCTG CTGCCTGCCG ACACCCAAAT ATGGCGACGG GGCAGGCAGC  
GTCCACAACC GGTTGTGGAC GACGGACGGC TGTGGGTTTA TACCGCTGCC CCGTCCGTC

EagI

BsmI

121 AGGTGTTGGG GGAGTTATTT TTAGAGCGGA CACCCAAATA TGGCGACGGC CGGGGCCGCA  
TCCACAACCC CCTCAATAAA AATCTCGCCT GTGGGTTAT ACCGCTGCCG GCCCCGGCGT

BmyI

EcoRII	BsiHKAI	NgoMI
BstNI	Bsp128I	Cfr10I
MvaI	HgiAI	NaeI
BsmI	AspHI	BsrFI
TaqI		
AAGGACCCCC	GGCCCGCCAC	GAGGGCGGGC GGAGCTATT TCCGAGGCC CGGCCCGCCGC

BanI

BsaHI

CfoI

HaeII

HhaI

HinP1I

KasI MaeI

NarI XbaI

AcyI BfaI

241 GCCCACGAGC TACCCGGAGG AGCGGGAGGC GCCAAGCTCT AGA  
CGGGTGCTCG ATGGGCCTCC TCGCCCTCC CGGTTCGAGA TCT

Figure 18

c6-39

SRE →                    MEF-2 →                    MEF-1

ggccgtccgc cctcggaaca cccaaatatg gcgacggcgc tctaaaata actccc ccaa 60

MEF-1 →                    SRE →                    ← MEF-1                    MEF-2  
cacctgctgc ctgcccacac cccaaatatgg caacggggca ggcagcaagg gtttggcgct 120

MEF-2 →  
ctaaaaataa ctccccccga gggcggacgg ccggggccgc attcctgggg gccggggcggt 180

gctcccgccc gcctcgataa aaggctccgg ggccggcggc ggcccacgag ctacccggag 240

gagcgggagg cgccaagctc taga 264

EagI                    BsmFI  
-----  
1 CGGCCGTCCG CCCTCGGGAC ACCAAATAT GGCGACGGCG CTCTAAAAAT AACTCCCCCA  
GCCGGCAGGC GGGAGCCCTG TGGTTTATA CCGCTGCCGC GAGATTTTA TTGAGGGGGT

61 ACACCTGCTG CCTGCCGACA CCCAAATATG GCAACGGGGC NAGGCAGCAG GTGTTTGGCG  
TGTGGACGAC GGACGGCTGT GGGTTTATAC CGTTGCCCG NTCCGTCGTC CACAAACCGC

BstNI  
-----  
EcoRII  
-----  
MvaI  
-----  
EagI                    BsmI  
-----  
121 CTCTAAAAAT AACTCCCCCA GAGGGCGGAC GGCGGGGGCC GCATTCCTGG GGGCCGGGGCG  
GAGATTTTA TTGAGGGGGG CTCCCGCCTG CCGGCCCCGG CGTAAGGACC CCCGGCCCCGC

BmyI  
-----  
BsiHKAI                    NgoMI  
-----  
Bsp1286I                    Cfr10I  
-----  
HgiAI                    NaeI  
-----  
AspHI                    TaqI                    BsrFI  
-----  
181 GTGCTCCCGC CCGCCTCGAT AAAAGGCTCC GGGGCCGGCG GCGGCCAACG AGCTACCCGG  
CACGAGGGCG GGCAGGACTA TTTTCCGAGG CCCCGGCCGC CGCCGGGTGC TCGATGGGCC

BanI  
-----  
BsaHI  
-----  
KasI                    MaeI  
-----  
NarI                    XbaI  
-----  
BsrBI                    AcyI                    BfaI  
-----  
241 AGGAGCGGGGA GGCGCCAAGC TCTAGA  
TCCTCGCCCT CCGCGGTTCG AGATCT

Figure 19